

Tommy John Surgery Made Easy

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History

- 288 Victories
 - 7th highest total for a leftie
 - He is best known for the surgery named after him
 - Over half after his wins were after his surgery
- Surgery by Jobe in 1974
 - They became great friends
 - Subject of 2013 "30 for 30" documentary

Tommy John







News from the dugout

- UCL reconstruction
 - A study demonstrated 193% increase in UCL reconstruction in the general population
 - Marked increase in 17-18 & 19-20 age range
- Perception
 - In a survey, 51% of high school athletes, 37% of parents, & 30% of coaches thought that UCL reconstruction should be performed on players without an elbow injury to enhance performance.

Is this a problem?



- Baseball is a year-round sport for youth
 - Especially in warmer climates
- Prospective cohort study followed 481 youth pitchers for 10 years
- Found that players who pitched >100 innings/calendar year had a 3.5x greater chance of sustaining a serious injury.
- The USA Baseball Medical/Safety Advisory Committee was designed to provide scientifically-based info to young players to reduce injury

Prevention

Table 1

USA Baseball Medical/Safety Advisory Committee Recommendations on Limits on Pitches by Youth Athletes^{16,17}

Age (y)	Pitches per Game
9–10	50
11–12	75
13–14	75
15–16	90
17–18	105

Adapted with permission from Kerut EK, Kerut DG, Fleisig GS, Andrews JR. Prevention of arm injury in youth baseball pitchers. *J La State Med Soc* 2008;160(2):95-98.

Prevention

- No breaking pitches
- Proper mechanics
- One team
- **Rest**

Table 3

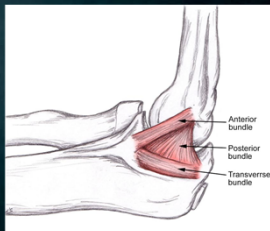
USA Baseball Medical/Safety Advisory Committee Recommendations for Youth Pitchers^{16,17}

No breaking pitches (curveball, sliders) until puberty (approximately age 13 y)
 Proper pitching mechanics in youth and year-round physical conditioning should be stressed.
 Discourage youth from pitching for more than one team in a season.
 Three-month rest period per year from overhead throwing activities

UCL Anatomy

- 3 components

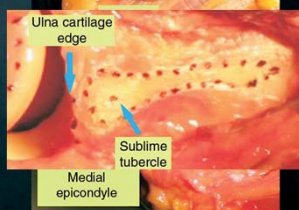
- Posterior bundle
 - Fan shaped thickening of the capsule
 - Forms the floor of the cubital tunnel
 - Tighter in flexion
- Transverse ligament
 - No contribution to stability
 - Both originates and inserts on ulna



UCL Anatomy

- **Anterior Bundle**

- Strongest and most significant stabilizer to valgus stress (30°-120°)
- Courses from anteroinferior medial epicondyle to the sublime tubercle of ulna
- 2 bundles
 - Anterior- primary valgus restraint
 - Posterior- 90-120°



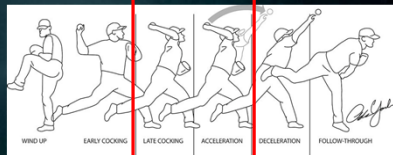
Throwing Motion

- **Stage IV Acceleration**

- 40 - 50 msec
- 600,000 deg./sec² elbow acceleration
- ↑ Valgus Stress
- **Majority of Injuries**

- **Curve Ball**

- Elbow Decel. / Shorter Time
- Increased Angular Velocity



Risk factors for complete MCL tears

- Pre-existing Micro Tears MCL
- Inadequate down time
- Improper Mechanics
- Poor Flexibility
- Poor Conditioning



History

Acute

- Sudden Medial Pain
- "Pop"
- Unable to continue throwing

Chronic

- Gradual onset pain
- Late Cocking / Acceleration Phase
- Inability to throw > 50% - 75%
- Ulnar nerve symptoms
- Flexion Contracture

Exam: Special Tests

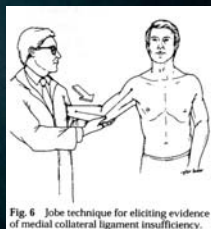
Milking Maneuver

- Tests Post. Band UCL (Important in throwing)
- Forearm Supination
- Shoulder Extension
- Elbow > 90° Flexion
- Pull on Thumb
- Apprehension & medial pain



Valgus Stress Test

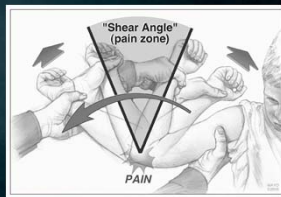
- Valgus Stress
- 20° - 30° Elbow Flexion
- Tests Ant. Band UCL
- Medial Opening
- No End Point
- Compare to Contralateral Elbow



Moving Valgus Stress Test

- Valgus stress
- Range through FROM
- Positive test if
 - Subjective apprehension
 - Objective instability
 - Pain at the MCL origin between

70-120°



Imaging

- Xray:
 - AP, Lateral and oblique of the elbow
 - Bilateral valgus stress views
- MRI
 - Arthrogram
 - o Full thickness vs partial
 - o Capsular T-sign
- Dynamic Ultrasound
 - can evaluate laxity with
 - operator dependent



Treatment

- Non-operative
 - First line treatment
 - Rest and PT
 - o 6 weeks of rest from throwing
 - o flexor-pronator strengthening and improving throwing mechanics
 - o Progressive throwing program
 - PRP injection?

Results

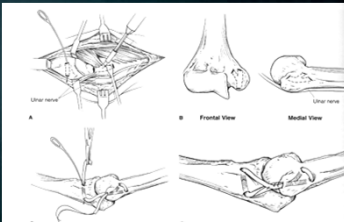


- 31 Athletes
- 3 months of rest & rehabilitation
- 42% return to previous level
- Average time of return 24.5 weeks

Operative Treatment

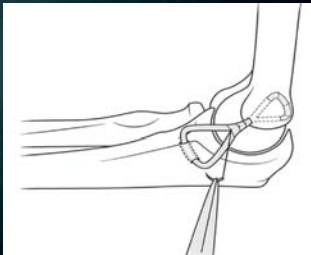
Operative Treatment

- Acute
 - Direct Repair
- Vs
- Reconstruction
- Chronic
 - > 3months
 - Failed non-op
 - Reconstruction with autograft



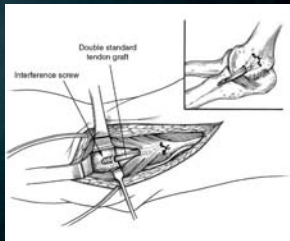
Original Technique

- Autograft
 - Palmaris longus, gracilis
- Modified Jobe
 - figure-of-eight reconstruction



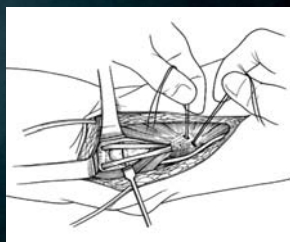
Evolving Techniques

- Hybrid interference-screw technique
 - Interference-screw fixation into the ulna
 - Docking fixation on the humerus

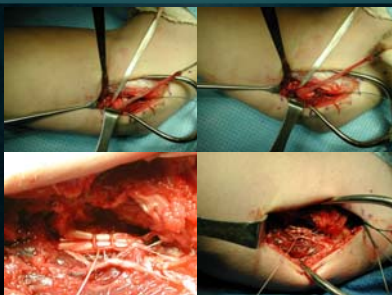


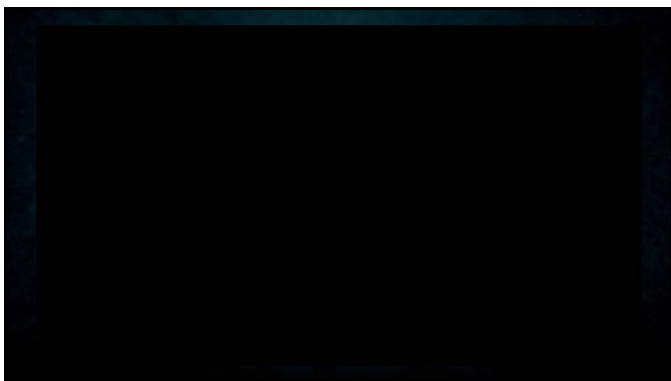
My Technique

- Docking
 - Graft limbs are tensioned through single humeral tunnel



Technique






Results from original series

- Jobe et al., JBJS, '86
 - 16 patients UCL recon. & Ulnar N. Transposition
 - 63% return to preinjury level

Subsequent Results

- Jobe et al., JSES, 1997
 - 83 athletes (56 Pro, 18 College)
 - UCL recon. No transposition
 - 4% paresthesia, 1% neuropathy, all resolved
 - 82% Excellent, 12% Good
 - 13 months to return



Results – Repair vs Recon

- Conway et al., JBJS, '92
 - 14 repair, 56 recon.
 - Repair
 - 71% G/E, 50% return pre-injury
 - Avg. 9 months return to play
 - Reconstruction
 - 80% G/E, 68% return to pre-injury
 - Avg. 12 months return

Results – Docking Technique

- Jones et al., JBJS, '12
 - Throwing athletes
 - 90-92% return to previous level of competition

Outcomes

- Humeral docking associated with better patient outcomes and lower complication rate compared to figure-of-8 fixation
- Humeral docking with interference screw fixation of the ulnar side showed strength of 95% of the native MCL
- Andrews et al – JAAOS 2014

Post-Operative Care

- Early
 - early active wrist, elbow, and shoulder range of motion
 - strengthening exercises beginning four to six weeks post-op
- Mid-term
 - initiate a progressive throwing program at four months
 - avoid valgus stress until 4 months post-op
- Return to competitive throwing at 9-12 months post-op

Summary

- Prevention is key
- Maximize non-op in chronic situations
- When surgery required
 - Autograft
 - Docking technique

Thank You
